



INFLUENCE OF LOSSES ON THE CROWN ON ACCURACY OF DEFINITION OF THE PLACE OF DAMAGE TO HIGH-VOLTAGE OVERHEAD TRANSMISSION LINES

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Abstract: In article influence of losses on a crown on accuracy of definition of a place of damage on high-voltage overhead power transmission lines is examined. Results of calculations of indications of devices are resulted at s.c. On models of an overhead line, and also results of calculation under these indications of distance up to a place s.c. On same line, but at presence of losses on a crown.

Keywords: Definitions of places of damage on high-voltage overhead transmission lines, a corona loss, mathematical model of the transmission line, the device fixing parameters of emergency mode (DFEM) of the transmission line.

1. INTRODUCTION

Damages of overhead lines of power transmission happen more often during a bad weather when the humidity reducing in growth of a corona loss on wires raises, were under high potential. The corona calls a leakage of an additional current, the distributed along a line. On size of this current the current fixed by registrars of emergency events changes. Therefore by development of programs for definition of places of damage is of interest to estimate: as far as this effect is great, it can reduce in what lapse of fault localization and whether it is necessary to take into account it.

2. A PROCEDURE OF MODEL OPERATION OF AN AIRLINE OF POWER TRANSMISSION

In the Department of power cybernetics of Academy of sciences of Moldova the mathematical model a lot of a wire overhead lines of power transmission in phase coordinates [1] designed. Mathematical model in the form of a gear matrix as [A] gain on the basis of matrixes of initial line characteristics and calculate under the following formula:

$$[A_0] = [E] + \sum_{n=1}^{\infty} \begin{bmatrix} [0] & [Z] \\ [Y] & [0] \end{bmatrix}^n \cdot \frac{\Delta^n}{n!} \quad (1)$$

where : [E] - a unit matrix, [Z] - a matrix of resistances of wires of a line,

[0] - a zero matrix,

[Y] - a matrix of conductivity of wires of a line.

On the basis of this model for industrial power association Chabarovskenergo the Automated workplace for search of damages on overhead line of power transmission of a high voltage 110 kV has been created and is higher. Accuracy of definition of places of damage has been checked observationally on the overhead line 110 kV Beketovo - New Sterlitamak in Bashkirenergo [2].

3. AN ESTIMATION OF EFFECT OF A CORONA LOSS ON ACCURACY OF FAULT LOCALIZATION PLACES OF DAMAGE OF AN OVERHEAD LINE

For conducting research the two catenary line of power transmission overhead line - 220 kV by an expansion of 200 kms on mast such as P 220-2 under catalogue ОПГРЭС picked. Wires of a line of brand A-300, an overhead ground-wire cable of a brand the AS-50, conductivity of a ground - 0.005 S / m.

Parameters of a condition of a line: - in the beginning of line $U_{bl} = 220$ kV, $I_l = 200$ A, - at the end of line $U_{el} = 210$ kV.

Parameters of a condition of a web in which the line works:

- The equivalent resistance of an electric power system reduced in trunks of the beginning and the extremity lines it is accepted equal $Z_e = 10 + j20$ Ohm. Corona loss of a line 585 Ws / km are accepted.

These losses it is taken into account by a cross conduction in a matrix [Y]-a matrix of conductivity of wires of a line, at span in length of 200 m, conductivity in a matrix of wires is accepted $2,78 \times 10^{-5}$ s.

Damage was simulated as a short-circuit in a phase "B" first circuits of a line, transitional resistance in a place s.c. on ground it is accepted an equal 0.1 Ohm.

The short-circuit has been simulated on 36,7 kms of a line, and on 148 km. The short-circuit single-phase on ground, picked s most frequently occurring in

networks (more than 80 %). At fault localization parameters of emergency mode were fixed with the help of two types of fixing devices DFEM Io and DFEM Uo.

Outcomes of account are tabulated:

№	weather	The complete losses in a line		DFEM in the beginning of a line	Indications	mast		lapse	
		κW	κWar		Relative unit	№	km	km	%
1	dry	328.4	59.0	Uo	318.05	185	36.8		
2	crude	445.7	143.6	Uo	318.00	183	36.4	0.4	0.41
3	dry	328.4	59.0	Uo	112.00	741	148.0		
4	crude	445.7	143.6	Uo	112.05	758	151.4	- 3.4	- 2.30
5	dry	328.4	59.0	Io	284.47	185	36.8		
6	crude	445.7	143.6	Io	284.97	183	36.4	0.4	0.41
7	dry	328.4	59.0	Io	100.17	741	148.0		
8	crude	445.7	143.6	Io	100.08	759	151.6	- 3.6	- 2.43

Tabl. 1

4. CONCLUSION

For extended high-voltage power lines the disregard effect of a corona loss in wires reduces in origin of a lapse commensurable about accuracy of definition of places of damage, therefore for increase of accuracy of fault localization it is necessary to take into account effect of a corona.

5. REFERENCES

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